



RS2012 Reinventing Space Conference

Comparison of Two Recent Launch Abort Platforms

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ABSTRACT

“The development of new and safer manned space vehicles is a top priority at NASA. Recently two different approaches of how to accomplish this mission of keeping astronauts safe was successfully demonstrated. With work already underway on an Apollo-like launch abort system for the Orion Crew Exploration Vehicle (CEV), an alternative design concept named the Max Launch Abort System, or MLAS, was developed as a parallel effort. The Orion system, managed by the Constellation office, is based on the design of a single solid launch abort motor in a tower positioned above the capsule. The MLAS design takes a different approach placing the solid launch abort motor underneath the capsule. This effort was led by the NASA Engineering and Safety Center (NESC). Both escape systems were designed with the Ares I Rocket as the launch vehicle and had the same primary requirement to safely propel a crew module away from any emergency event either on the launch pad or during ascent. Beyond these two parameters, there was little else in common between the two projects, except that they both concluded in successful launches that will further promote the development of crew launch abort systems.

A comparison of these projects from the standpoint of technical requirements; program management and flight test objectives will be done to highlight the synergistic lessons learned by two engineers who worked on each program. This comparison will demonstrate how the scope of the project architecture and management involvement in innovation should be tailored to meet the specific needs of the system under development.

Topics

This paper will address the following topics:

Launch — The single biggest impediment to dramatically lower cost, more rapid missions is low-cost, responsive access to space, particularly for smaller satellites. Will the Russians and Chinese be the only ones with low-cost launch-on-demand?

Mission and Systems Engineering — What is the status of low-cost mission design, measures of effectiveness, orbits, and getting information to the end user within hours of an unexpected event?